4. Exponentiation

Program Name: Exponentiation.java Input File: exponentiation.dat

Consider a number system that works with ordered pairs of decimal values, e.g. N = (a, b), where N is an ordered pair and a and b are decimal values. The following rules apply for arithmetic in this system:

- Addition: (a, b) + (c, d) = (a+c, b+d)
- Subtraction: (a, b) - (c, d) = (a-c, b-d)
- Multiplication: (a, b) * (c, d) = (a*c - b*d, a*d + b*c)
- Exponentiation simply repeats multiplication.

Given a single instance of N in the above system and an integer m, write a program that prints out the value N^M, i.e., N * N * N… M times.

Input

The first line has an integer T, with T data sets to follow.
Each data set contains two decimal values a, and b, representing the ordered pair (a, b), followed by an integer M representing the exponent.

Output

For each test case, output the answer as an ordered pair, bracketed as shown, without spaces.

Constraints

```
0 <= T <= 10
1 <= M <= 20
-10 <= a <= 10
-10 <= b <= 10
```

Example Input File

```
3
5.0 1.0 2
4.5 -7.5 3
-1.0 10 5
```

Example Output to Screen

```
(24.0,10.0)
(-668.25,-33.75)
(-49001.0,90050.0)
```